UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,508	10/18/2001	Masaou Matsuda	358362010400	5230

7590   11/25/2008

Barry E Bretschneider
Morrison & Foerster
2000 Pennsylvania Avenue N W
Washington, DC 20006-1888

EXAMINER
STEELE, JENNIFER A

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
11/25/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

_____

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

_____

Ex parte MASAOU MATSUDA, MAKI SATO,
SHOICHI GYOBU, FUMIKAZU YOSHIDA,
MUNEKAZU OKUHARA, TAKASHI DOKE,
HIDEO TAKEUCHI, and KENJI SHIMIZU

_____

Appeal 2008-4913
Application 09/889,508
Technology Center 1700

_____

Decided: November 25, 2008

_____

Before EDWARD C. KIMLIN, CHUNG K. PAK, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1, 2, 4, and 6-12, the only claims pending in the application.[1] We have jurisdiction under 35 U.S.C. § 6(b).

_____

[1] An oral hearing was held on November 5, 2008.

We AFFIRM.

BACKGROUND

The invention relates to a flame-retardant polyester fiber which is said to be superior in dyeing property, color fastness to light, abrasion resistance and heat stability. (Spec. 1, ll. 6-8.) Claim 1 is illustrative of the invention and is reproduced below:

1.   A flame-retardant polyester fiber comprising a phosphorus compound copolymerized polyester comprising a phosphorus atom in a side chain and satisfying the following formulas (1)-(3):

Formulas 1-3 of Claim 1 are reproduced below.

$$\tan \delta_{max} \geq 0.236 \qquad \text{(formula 1)}$$

$$T\alpha - 3.77 \times \ln(\text{dtpf}) \leq 137.0 \qquad \text{(formula 2)}$$

$$1.331 \leq SG - \frac{\sqrt{\Delta n}}{8.64} \leq 1.345 \qquad \text{(formula 3)}$$

Formulas 1-3 of Claim 1 are reproduced above.

Wherein δ_{max} is a maximum value of loss tangent in a dynamic viscoelasticity measurement, $T\alpha$ is a temperature at which loss tangent reaches the maximum, dtpf is single fiber fineness (dtex), SG is density (g/cm^3), Δn is birefringence and wherein the flame-retardant polyester fiber is produced by melt-spinning at a take-up speed of 1000 m/min - 4500 m/min, has a phosphorus content of 500-50,000 ppm, has a shrinkage in hot water (SHW) of not more than 10%, and in a yarn abrasion test the number of times before fiber breakage under a load of 0.098 N/tex is not less than 7720 times.

The Examiner relies on the following prior art references to show unpatentability:

Tashiro	4,721,746	Jan. 26, 1988
Leumer	5,658,662	Aug. 19, 1997

| Buxbaum | 4,101,526 | Jul. 18, 1978 |
| Vogt | 5,952,413 | Sep. 14, 1999 |

Appellants request review of the following grounds of rejection:

1. claims 1, 2, 4, 6, 8, 11, and 12 under 35 U.S.C. § 103(a) as unpatentable over Tashiro in view of Leumer;

2. claim 7 under 35 U.S.C. § 103(a) as unpatentable over Tashiro in view of Leumer and further in view of Buxbaum; and

3. claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over Tashiro in view of Leumer and further in view of Vogt.

ISSUE

The issue presented for our review in this Appeal is: Have Appellants shown that the Examiner reversibly erred in concluding that a fiber based on the combined teachings of Tashiro/Leumer would inherently satisfy the properties (including formulas (1)-(3)) recited in claim 1?

We answer this question in the negative for the reasons discussed below.

FINDINGS OF FACT ("FF")

1)   The appealed claims are drafted in product-by-process format.

2)   With respect to the first ground of rejection, Appellants confine their arguments to independent claim 1. (*See* App. 4-6.)

3)   With respect to the second and third grounds of rejection, Appellants rely on the arguments presented in connection with the first ground of rejection, noting that Vogt and Buxbaum fail to cure the deficiences of Tashiro and Leumer. (*See* App. Br. 6-7.)

4)   Appellants and the Examiner agree that Tashiro discloses "[a] flame-retardant polyester fiber comprising . . . a phosphorus atom

3

in a side chain" (claim 1). (App. Br. 5; *see also*, Ans. 3 and Tashiro, col. 3, ll. 19-20, col. 3, l. 65-col. 4, l. 2.) In addition, Appellants do not dispute the Examiner's finding that Tashiro's fiber has a phosphorus content of 5000 to 70,000 ppm (Ans. 3 (citing Tashiro, col. 6, ll. 30-50)). (*See generally*, App. Br. and Reply Br.)

5)   The Examiner concedes that Tashiro fails to disclose that the fiber is "produced by melt-spinning at a take-up speed of 1000 m/min-4500 m/min" (claim 1). (Ans. 3.) This claim 1 limitation is a process limitation.

6)   Leumer discloses a method of producing high tenacity, low flammability polyester yarn wherein the yarn is spun at a take-up speed above 300 m/min, preferably 500-1500 m/min (Col. 8, ll. 46-53.) Leumer teaches that the polyester is melt spun and heat set at a temperature ranging from 225 - 240 degrees Celsius (Col. 8, ll. 53 - 65 and Col. 9, ll. 1 - 5). The total draw ratio is from 1:4.5 to 1:6 (Col. 8, ll. 60 - 65).

7)   The Examiner concludes that

> It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the copolymerized polyester with a phosphorus atom in a side chain of Tashiro with a take-up speed of greater than 300 m/min, in particular at a spinning take-off speed from 500 - 1500 m/min as suggested by Leumer motivated by the desire to create a flame-retardant polyester fiber at a spinning speed which reflects current spinning capacities in order to improve production speed and having a low shrinkage level which is suitable for industrial fabrics (see Leumer, column 9).
> (Ans. 4.)

4

8)   The Examiner concedes that neither Tashiro nor Leumer explicitly discloses a fiber which satisfies formulas (1)-(3) of claim 1. (Ans. 5.) However, the Examiner maintains that the claim 1 properties would be inherent in a fiber based on the combined teachings of Tashiro/Leumer since Tashiro uses "like materials (i.e. a fiber comprising polyester copolymerized with phosphorus, wherein the phosphorus is present in the amount of 5,000-70,000 ppm)." (Ans. 5.)

9)   Appellants argue that in order to satisfy formulas (1)-(3) of claim 1, a fiber must have a certain dyeability and abrasion resistance. (App. Br. 5.) According to Appellants, dyeability and abrasion resistance are affected by the process of drawing a fiber after spinning. (App. Br. 5.) Appellants thus maintain that "satisfying formulas 1-3 is related to the draw ratio." (Reply Br. 2.)

10)   According to Appellants, "[a] higher draw ratio degrades the dyeability and abrasion resistance of the fiber." (App. Br. 5.)

11)   Appellants rely on the Specification (*e.g.*, p. 17, ll. 23-24 and p. 17, l. 30-p. 18, l. 9) as evidence that increasing draw ratio degrades the dyeing property of the fiber. (Reply Br. 2.) The relied upon portions of the Specification state that when certain processing parameters are not met (i.e., shear rate of the discharged polymer and distance from the spinneret surface to the cooling air outlet), draw ratio may be increased, which in turn results in degraded dying property of the fiber. With respect to the aforementioned distance parameter, the Specification states "[t]his has a consequence that the fiber has a tan δ max of less than 0.250 and the objective fiber of the

5

present invention is difficult to obtain" (Spec. 18, ll. 7-9). The relied upon portions of the Specification do not specify a draw ratio.

12)   The Specification further states that where "tan δ max . . . is less than 0.1740, dyeing property becomes extremely low to the degree that the required level cannot be met" (Spec. 18, ll. 30-33). (*See* Rep. Br. 2, last para.)

13)   Claim 1 formula (1) requires "tan $\delta_{max} \geq 0.236$".

14)   Appealed claim 1 does not recite a "draw ratio."

15)   Appellants assert that in the Specification Examples, the highest draw ratio used to produce fibers satisfying formulas (1)-(3) was 2.8 fold. (App. Br. 5.)

16)   In Comparative Example 3 of the Specification, a draw ratio of 2.92 was used to produce a fiber having tan δ_{max} = 0.237. (Spec. 37, Table 1.) *See supra*, FF 13. The Comparative Example 3 fiber also appears to satisfy claim 1 formula's (2) & (3), as well as possess the properties recited in claim 1.

17)   Appellants argue that Tashiro's fibers are "drawn at a draw ratio far higher than the claimed draw ratio." (App. Br. 5 (noting that in Tashiro's Examples, fibers are drawn 3.5 fold).)

18)   Appellants likewise argue that Leumer "discloses a fiber created with a draw ratio far above the draw ratio used by Appellants." (App. Br. 5 (noting that Leumer discloses draw ratios of 4.5 to 6.0 fold).)

19)   Appellants argue that because Tashiro and Leumer both utilize higher draw ratios, "a fiber produced according to [the

processes of] Tashiro and Leumer would not <u>necessarily</u> satisfy formulas (1)-(3)" of claim 1. (App. Br. 5.)

20) Appellants state that a Declaration of Ryouji Nakamura was filed in the present application on May 31, 2005, and establishes that "a flame-retardant polyester fiber satisfying formulas 1-3 could not be obtained at a high draw ratio of 4.6, but could be obtained at a draw ratio of 2.88 or below." (Reply Br. 2.)

21) Appellants have not identified any experimental evidence which establishes that a flame retardant polyester fiber satisfying claim 1, formulas (1)-(3) and including the additional properties recited in claim 1, could not be obtained using a draw ratio of 3.5.

22) The Examiner relies on column 9, lines 32-38 of Leumer to establish that "drawing and setting temperature and draw ratio are result effective variables which are directly related to the properties of flammability, tenacity, breaking extension and modulus of elasticity." (Ans. 11.)

23) Appellants argue that the relied upon portion of Leumer actually teaches against lowering the draw ratio to satisfy formulas 1-3. (Reply Br. 3.)

24) Leumer discloses a preferred embodiment of a two stage drawing process in which the second stage is carried out at a temperature of from 215 to 235 and a total draw ratio of 4.5 to 6 fold. (Col. 8, ll. 53-64; *see* Ans. 4.) Leumer discloses that the drawn filaments are optionally subjected to a setting and relaxing treatment at temperatures from 225 to 240 ºC to set desired breaking extension

and required heat shrinkage. (Col. 9, ll. 1-4; *see* Ans. 4.) Column 9

of Leumer further states:

> It is of particular importance that the combination of low flammability with a high tenacity and a broad, process-adjustable spectrum of the thermal shrinkage is only obtained in the multifilament yarns of the present invention when the drawing and setting temperature is at no time higher than that stated above. High drawing and setting temperatures lead to an appreciable decrease in the tenacity.
> (Col. 9, ll. 17-23.)

> The stated process conditions make it possible for example to produce yarns having flame resistant properties which, in terms of tenacity, breaking extension and modulus of elasticity, are comparable to the high tenacity yarns made of unmodified polyesters (see for example Examples 3 and 4 in comparison with 12 and 13) and can therefore be used to equal effect in the corresponding fields of use.
> (Col. 9, ll. 32-38.)

PRINCIPLES OF LAW

During examination, claim terms must be given their broadest reasonable construction consistent with the specification. *In re Icon Health and Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007) ("[T]he PTO must give claims their broadest reasonable construction consistent with the specification. . . . Therefore, we look to the specification to see if it provides a definition for claim terms, but otherwise apply a broad interpretation."). "[E]ven though product-by-process claims are limited by and defined by the

process, determination of patentability is based on the product itself." *In re Thorpe*, 777 F.2d 695, 697 (Fed. Cir. 1985).

"[A] reference disclosure must be evaluated for all that it fairly [teaches] and not only for what is indicated as preferred." *In re Bozek*, 416 F.2d 1385, 1390, (CCPA 1969). "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994)

"If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *Thorpe*, 777 F.2d at 697; *see also*, *In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990) ("[W]hen the PTO shows sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not."). *Cf. In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) ("[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art."). Once the PTO establishes a prima facie case that the prior art product appears to be identical, the burden shifts to the Applicant to prove the prior art products do not necessarily or inherently possess the characteristics of the claimed product. *Thorpe*, 777 F.2d at 698.

All evidence of nonobviousness, including data in the specification, must be considered when assessing patentability. *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995) (citing *In re Margolis*, 785 F.2d 1029, 1031 (Fed. Cir. 1986)). However, the burden of analyzing and explaining data to support

nonobviousness rests with the Appellant. *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972). *Cf.* 37 C.F.R. § 41.67(c)(1)(ix) (requiring "copies of any evidence . . . entered by the examiner and relied upon by appellant in the appeal"); *Cross Med. Prods. Inc. v. Medtronic Sofamor Danek, Inc.,* 424 F.3d 1293, 1320-21 n3 (Fed. Cir. 2005) (It is well established that arguments not raised in the opening Brief are deemed waived.).

"[O]bjective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support." *In re Tiffin*, 448 F.2d 791, 792 (CCPA 1971). In addition, "when unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art." *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991). *See generally, Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1364 (Fed. Cir. 2007) (explaining that as long as the Examiner establishes "a reasonable probability of success," "obviousness cannot be avoided simply by a showing of some degree of unpredictability in the art"); *In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997) ("[A]ttorney argument [is] not the kind of factual evidence that is required to rebut a prima facie case of obviousness.").

ANALYSIS

The facts and reasons relied on by the Examiner provide a reasonable basis to conclude that a fiber based on the combined teachings of Tashiro/Leumer would inherently satisfy the properties (including formulas (1)-(3)) recited in claim 1. (*See* FF 4-8.) Therefore, the burden was properly shifted to Appellants to establish the contrary.

In order to meet this burden, Appellants argue that the claim 1 properties are not necessarily inherent in a fiber produced at a draw ratio

which exceeds 2.88. (FF 9, 10, 15, 19.) Appellants argue that Tashiro only discloses examples in which fibers are produced at a draw ratio of 3.5. (FF 17.) Appellants assert that one of ordinary skill in the art would not have been motivated to use a lower draw ratio because Leumer teaches away from using a draw ratio of less than 4.5. (FF 18, 23.)

Appellants' arguments are not persuasive. Appellants have not directed us to evidence which establishes any criticality in the use of a particular draw ratio. (FF 11-16.) Nor have Appellants adduced evidence to show that the draw ratio of 3.5 used by Tashiro would not result in a fiber having the properties recited in claim 1. (FF 20, 21.) Moreover, Appellants have not persuasively refuted the Examiner's finding that the draw ratio is a result effective variable, such that it would have been within the level of skill of the ordinary artisan at the time of Appellants' invention to have adjusted this parameter, as well as other process variables, to achieve the desired fiber properties. (FF 22-24.)

CONCLUSION

Appellants have not shown that the Examiner reversibly erred in concluding that a fiber based on the combined teachings of Tashiro/Leumer would inherently satisfy the properties (including formulas (1)-(3)) recited in claim 1. Therefore, the rejection of claims 1, 2, 4, 6, 8, 11, and 12 under 35 U.S.C. § 103(a) as unpatentable over Tashiro in view of Leumer is sustained. Because Appellants rely on the same arguments in support of patentability of claims 7 and 9-10 (*see* FF 3), we likewise sustain the rejection of claim 7 under 35 U.S.C. § 103(a) as unpatentable over Tashiro in view of Leumer and further in view of Buxbaum and the rejection of

claims 9 and 10 under 35 U.S.C. § 103(a) as unpatentable over Tashiro in view of Leumer and further in view of Vogt.

ORDER

The decision of the Examiner rejecting claims 1, 2, 4, and 6-12 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

ssl

BARRY E BRETSCHNEIDER
MORRISON & FOERSTER
2000 PENNSYLVANIA AVENUE N.W.
WASHINGTON, D.C. 20006-1888